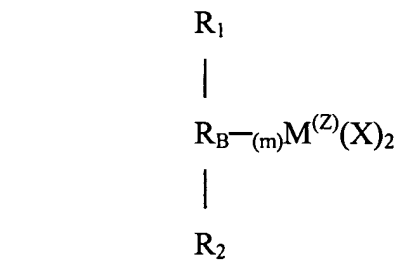
I CLAIM:

1. A bridged compound having the formula:



wherein M is a metal; each X is an atom or group covalently or ionically bonded to M and may be the same or different; R_1 and R_2 may be the same or each may be different and are substituted or unsubstituted cyclopentadienyl or aromatic rings; R_B is a structural bridge between the cylcopentadienyl or aromatic rings R_1 and R_2 and imparts stereorigidity to the rings, and comprises at least one heteroatom bonded to M, with each of R_1 and R_2 bonded to the same or different heteroatom of R_B; Z is the coordination number of M and is greater than or equal to 4; m is the number of bonds between M and heteroatoms of R_B and to impart sterorigidity $m \geq 2$; and with R_1, R_2 and R_B selected to provide a catalyst component with C_1, C_2 or C_S symmetry.

2 The compound of claim 1, wherein M is selected from the group consisting of transition metals and lanthanide metals, wherein the heteroatoms are selected from the group consisting of O, N, S, and P.

3 The compound of claim 1, wherein R_B comprises at least three heteroatoms, and wherein R_1 is bonded to one of the heteroatoms, and R_2 is bonded to a different one of the heteroatoms.

4 The compound of claim 1, wherein M is selected from among Fe, Co and Ni.

5 The compound of claim 1, wherein M is Fe, R_B comprises three heteroatoms bonded to M, and wherein R_1 is bonded to one of the three heteroatoms, and R_2 is bonded to a heteroatom different than the heteroatom to which R_1 is bonded; M is selected from among Fe, Co and Ni.

6 The compound of claim 5, wherein each X is independently selected from among halides and substituted or unsubstituted hydrocarbons.

7 A method of making a bridged compound comprising contacting a metal compound of the formula $M(X)_2$ with a bridged compound R_B of the formula

$$R_1 - R_B - R_2$$

wherein M is a metal; each X is an atom or group covalently or ionically bonded to M and may be the same or different; R_1 and R_2 may be the same or each may be different and are substituted or unsubstituted cyclopentadienyl or aromatic rings; R_B is a structural bridge between the cylcopentadienyl or aromatic rings R_1 and R_2 and imparts stereorigidity to the rings, and comprises at least one heteroatom suitable for bonding to M, with each of R_1 and R_2 bonded to the same or different heteroatom of R_B; and with R_1, R_2 and R_B selected to provide a bridged metallocene compound with C_1, C_2 or C_S symmetry.

8 The method of claim 7, wherein M is selected from the group consisting of transition metals and lanthanide metals, wherein the heteroatoms are selected from the group consisting of O, N, S, and P.

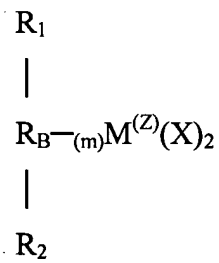
9 The method of claim 7, wherein R_B comprises three heteroatoms, and wherein R_1 is bonded to one of the three heteroatoms, and R_2 is bonded to a different one of the three heteroatoms.

10 The method of claim 7, wherein M is selected from among Fe, Co and Ni.

11 The method of claim 7, wherein M is Fe, R_B comprises at least three heteroatoms, and wherein R_1 is bonded to one of the three heteroatoms, and R_2 is bonded to a heteroatom different than the heteroatom to which R_1 is bonded; M is selected from among Fe, Co and Ni.

12 The method of claim 11, wherein each X is independently selected from among halides and substituted or unsubstituted hydrocarbons.

13 A catalyst system comprising an activated bridged compound having the formula:



wherein M is a metal; each X is an atom or group covalently or ionically bonded to M and may be the same or different; R_1 and R_2 may be the same or each may be different and are substituted or unsubstituted cyclopentadienyl or aromatic rings; R_B

is a structural bridge between the cylcopentadienyl or aromatic rings R_1 and R_2 and imparts stereorigidity to the rings, and comprises at least one heteroatom bonded to M, with each of R_1 and R_2 bonded to the same or different heteroatom of R_B which heteroatom is also bonded to M; Z is the coordination number of M and is greater than or equal to 4; m is the number of bonds between M and heteroatoms of R_B and to impart stereorigidity $m \geq 2$; and with R_1, R_2 and R_B selected to provide a catalyst component with C_1, C_2 or C_S symmetry.

14 The system of claim 13, wherein M is selected from the group consisting of transition metals and lanthanide metals, wherein the heteroatoms are selected from the group consisting of O, N, S and P.

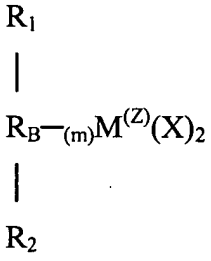
15 The system of claim 13, wherein R_B comprises at least three heteroatoms bonded to M, and wherein R_1 is bonded to one of the heteroatoms, and R_2 is bonded to a different one of the heteroatoms.

16 The system of claim 13, wherein M is selected from among Fe, Co and Ni.

17 The system of claim 13, wherein M is Fe, R_B comprises three heteroatoms bonded to M, and wherein R_1 is bonded to one of the three heteroatoms, and R_2 is bonded to a heteroatom different than the heteroatom to which R_1 is bonded; M is selected from among Fe, Co and Ni.

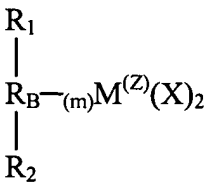
18 The system of claim 17, wherein each X is independently selected from among halides and substituted or unsubstituted hydrocarbons.

19 A method of making a catalyst system comprising contacting an activator with a bridged compound having the formula:



wherein M is a metal; each X is an atom or group covalently or ionically bonded to M and may be the same or different; R_1 and R_2 may be the same or each may be different and are substituted or unsubstituted cyclopentadienyl or aromatic rings; R_B is a structural bridge between the cylcopentadienyl or aromatic rings R_1 and R_2 and imparts stereorigidity to the rings, and comprises at least one heteroatom bonded to M, with each of R_1 and R_2 bonded to the same or different heteroatom of R_B which heteroatom is also bonded to M; Z is the coordination number of M and is greater than or equal to 4; m is the number of bonds between M and heteroatoms of R_B and to impart stereorigidity $m \geq 2$; and with R_1, R_2 and R_B selected to provide a catalyst component with C_1, C_2 or C_S symmetry.

20 A method of forming polyolefins comprising contacting olefin monomer or mixture of monomers in the presence of an activated bridged compound having the formula:



wherein M is a metal; each X is an atom or group covalently or ionically bonded to M and may be the same or different; R_1 and R_2 may be the same or each may be different and are substituted or unsubstituted cyclopentadienyl or aromatic rings; R_B

is a structural bridge between the cylcopentadienyl or aromatic rings R_1 and R_2 and imparts stereorigidity to the rings, and comprises at least one heteroatom bonded to M, with each of R_1 and R_2 bonded to the same or different heteroatom of R_B which heteroatom is also bonded to M; Z is the coordination number of M and is greater than or equal to 4; m is the number of bonds between M and heteroatoms of R_B and to impart sterorigidity $m \geq 2$; and with R_1, R_2 and R_B selected to provide a catalyst component with C_1, C_2 or C_S symmetry.